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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CURS, NATHAN M	
ART UNIT	**PAPER NUMBER**
2633	

DATE MAILED: 06/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/041,853	WAY, DAVID G.
	Examiner	**Art Unit**
	Nathan Curs	2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 March 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 11-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 11-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-9, 11, 13-17, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Colbourne et al. (US Patent No. 6654564) in view of Ishikawa (US Patent Application Publication No. 2002/0003646).

Regarding claim 1, Colbourne et al. disclose a dispersion compensation system comprising: a dispersion compensation module (DCM) operable to receive optical input and provide optical output having a negative dispersion relative to the optical input (fig. 13b, element R3 and fig. 19, element 192) and a dispersion enhancement module (DEM) adapted to be optically coupled between the DCM and an optical fiber having a positive dispersion (fig. 13b, element R1 and fig. 19, element 191), the DEM operable to selectively increase the positive dispersion provided by the optical fiber by any of a plurality of amounts and to provide the optical input to the DCM, the optical input having a positive dispersion substantially equal to the positive dispersion of the optical fiber plus a selected one of the amounts of dispersion in the DEM (col. 1, lines 7-9 and lines 18-27, and col. 4, lines 31-61 and col. 9, line 64 to col. 10, line 61). Colbourne et al. do not disclose the dispersion enhancement module comprising a plurality of dispersion enhancement fibers. Ishikawa discloses a variable dispersion compensation device using switched DCFs and fixed DCFs over various positive and negative compensation

values, the switched DCFs controlled by a controller (fig. 1 and fig. 13 and paragraph 0072). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the fixed and variable dispersion compensation devices of Ishikawa for the fixed and variable compensators of Colbourne et al. since dispersion compensation fiber is conventional and since the etalons of Colbourne require dimensions and free spectral range that are dependent on channel spacing of a multi-wavelength signal.

Regarding claim 2, the combination of Colbourne et al. and Ishikawa discloses the dispersion compensation system of claim 1, wherein a magnitude of the positive dispersion of the optical input is substantially equal to a magnitude of the negative dispersion of the DCM, such that the optical output has a dispersion near to zero (Colbourne et al.: col. 4, lines 31-61 and Ishikawa: paragraphs 0055-0057).

Regarding claim 3, the combination of Colbourne et al. and Ishikawa discloses the dispersion compensation system of claim 1, wherein the DCM is designed to compensate for dispersion along a fixed length of an optical fiber type, the optical fiber type having a positive dispersion per unit length and wherein, if the optical fiber coupled to the DEM has an actual length less than the fixed length, the selected amount of dispersion in the DEM increases dispersion by an amount substantially equal to dispersion resulting from a length of the optical fiber type equal to the difference of the fixed length and the actual length (Colbourne et al.: col. 1, lines 7-9 and lines 18-27 and col. 4, lines 31-61 and Ishikawa: paragraphs 0055-0057).

Regarding claim 4, the combination of Colbourne et al. and Ishikawa discloses the dispersion compensation system of claim 1, but does not disclose two amplifiers, where the DCM is between the two amplifiers. However, Ishikawa teaches a variable dispersion compensator at a node, where an amplifier is used in conjunction with the compensator to amplify the received signal after the signal has traveled a length of fiber (fig. 10 and paragraphs

63-65). It would have been obvious to one of ordinary skill in the art at the time of the invention to place amplifiers after the DCF compensators of the combination of Colbourne et al. and Ishikawa since DCF fiber is also a length of fiber that contributes loss to the signal.

Regarding claim 5, the combination of Colbourne et al. and Ishikawa discloses the dispersion compensation system of claim 1, and disclose one of the compensators having a fixed dispersion compensation value (Colbourne et al.: col. 4, lines 53-61 and Ishikawa: fig. 1 and paragraphs 0055-0057), and disclose dispersion compensation fiber having a fixed dispersion compensation value and disclose that the DCM comprises dispersion compensation fiber having a defined negative dispersion per unit length (Colbourne et al.: col. 9, lines 12-14 and Ishikawa: fig. 1 and paragraphs 0055-0057).

Regarding claim 6, the combination of Colbourne et al. and Ishikawa discloses the dispersion compensation system of claim 1, and discloses that the DEM comprises a plurality of dispersion enhancement fibers each having a defined positive dispersion per unit length, each of the dispersion enhancement fibers having a different length (fig. 13 and paragraph 0072), but does not disclose that each of the plurality of dispersion enhancement fibers comprises a defined positive dispersion per unit length. However, Ishikawa discloses that the variable dispersion compensator can be set to either positive or negative dispersion to adjust overall compensation as a result of either over-compensation by the fixed compensator or under-compensation by the fixed compensator (paragraphs 0055-0057). It would have been obvious to one of ordinary skill in the art at the time of the invention that the variable dispersion compensator could be configured only to adjust overall compensation for the case of over-compensation by the fixed compensator, requiring only positive dispersion fiber section in the variable compensator, since adjustment for both cases are disclosed. In the case where a

claimed range (i.e. "positive") overlaps or lie inside ranges disclosed by the prior art (i.e. "negative and positive" in Ishikawa), a prima facie case of obviousness exists.

Regarding claim 7, the combination of Colbourne et al. and Ishikawa discloses the dispersion compensation system of claim 1, wherein the DEM is operable to selectively couple one or more of the dispersion enhancement fibers together to form an optical path coupling the optical fiber to the DCM through the selected one or more of the dispersion enhancement fibers (Ishikawa: fig. 13 and paragraph 0072).

Regarding claim 8, the combination of Colbourne et al. and Ishikawa discloses the dispersion compensation system of claim 1, wherein the DEM comprises a controller operable to: determine the negative dispersion of the DCM; determine the positive dispersion of the optical fiber; and determine the selected one of the amounts of dispersion in the DEM to provide the optical input having a positive dispersion substantially equal to an inverse of the negative dispersion of the DCM (Colbourne et al.: col. 11, lines 3-22 and Ishikawa: fig. 13 and paragraph 0072).

Regarding claim 9, Colbourne et al. disclose a method for dispersion compensation comprising: providing an optical transport fiber coupling a first network element and a second network element, the transport fiber having a first positive dispersion (col. 1, lines 7-9 and lines 18-27); providing a dispersion enhancement module disposed between the transport fiber and the second network element (fig. 13b, element R1 and fig. 19, element 191); determining a negative dispersion of the second network element (col. 11, lines 3-22); and configuring the dispersion enhancement module to provide second positive dispersion, the sum of the first positive dispersion and the second positive dispersion substantially equal to the magnitude of the negative dispersion (col. 4, lines 31-61 and col. 9, line 64 to col. 10, line 61). Colbourne et al. do not disclose that routing signals from the transport fiber through the dispersion

enhancement module comprises routing signals through one or more dispersion enhancement fibers. Ishikawa discloses a variable dispersion compensation device using switched DCFs and fixed DCFs over various positive and negative compensation values, the switched DCFs controlled by a controller (fig. 1 and fig. 13 and paragraph 0072). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the fixed and variable dispersion compensation devices of Ishikawa for the fixed and variable compensators of Colbourne et al. since dispersion compensation fiber is conventional and since the etalons of Colbourne require dimensions and free spectral range that are dependent on channel spacing of a multi-wavelength signal.

Regarding claim 11, the combination of Colbourne et al. and Ishikawa discloses the method claim 9, and discloses the compensators having a fixed dispersion compensation value (Colbourne et al.: col. 4, lines 53-61 and Ishikawa: fig. 1 and paragraphs 0055-0057), and disclose dispersion compensation fiber having a fixed dispersion compensation value and disclose that the negative dispersion in the second network element results from dispersion compensation fiber having a defined negative dispersion per unit length (Colbourne et al.: col. 9, lines 12-14 and Ishikawa: fig. 1 and paragraphs 0055-0057).

Regarding claim 13, Colbourne et al. disclose a dispersion compensation system comprising: a dispersion compensation device (fig. 13b, element R3 and fig. 19, element 192) and a dispersion enhancement module (DEM) (fig. 13b, element R1 and fig. 19, element 191) adapted to be optically coupled to an optical fiber having a positive dispersion and to receive an optical input from the optical fiber, the DEM operable to selectively increase the positive dispersion provided by the optical fiber by any of a plurality of amounts, the optical input having a positive dispersion substantially equal to the positive dispersion of the optical fiber plus a selected one of the amounts of dispersion in the DEM (col. 1, lines 7-9 and lines 18-27, and col.

4, lines 31-61 and col. 9, line 64 to col. 10, line 61). Colbourne et al. do not disclose a first optical amplifier and a second optical amplifier and a dispersion compensation fiber optically coupled between the first optical amplifier and the second optical amplifier, the dispersion compensation fiber operable to receive optical input from the first optical amplifier and provide optical output to the second optical amplifier, the optical output having a negative dispersion relative to the optical input, and do not disclose the dispersion enhancement module comprising a plurality of dispersion enhancement fibers. Ishikawa discloses a variable dispersion compensator at a node, where an amplifier is used in conjunction with the compensator to amplify the received signal after the signal has traveled a length of fiber (fig. 10 and paragraphs 63-65). It would have been obvious to one of ordinary skill in the art at the time of the invention to further place amplifiers after the DCF compensators of Ishikawa since DCF fiber is also a length of fiber that contributes loss to the signal. Ishikawa also discloses a variable dispersion compensation device using switched DCFs and fixed DCFs over various positive and negative compensation values, the switched DCFs controlled by a controller (fig. 1 and fig. 13 and paragraph 0072). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the fixed and variable dispersion compensation devices of Ishikawa for the fixed and variable compensators of Colbourne et al. since dispersion compensation fiber is conventional and since the etalons of Colbourne require dimensions and free spectral range that are dependent on channel spacing of a multi-wavelength signal.

Regarding claim 14, the combination of Colbourne et al. and Ishikawa disclose the dispersion compensation system of claim 13, wherein the DEM comprises a plurality of dispersion enhancement fibers each having a defined positive dispersion per unit length, each of the dispersion enhancement fibers having a different length (Ishikawa: fig. 13 and paragraph 0072).

Regarding claim 15, the combination of Colbourne et al. and Ishikawa disclose the dispersion compensation system of claim 14, wherein the DEM is operable to selectively couple one or more of the dispersion enhancement fibers together to form an optical path coupling the optical fiber to the DCM through the selected one or more of the dispersion enhancement fibers (Ishikawa: fig. 13 and paragraph 0072).

Regarding claim 16, Colbourne et al. disclose a dispersion enhancement module (fig. 13b, element R1 and fig. 19, element 191) adapted to be optically coupled to a dispersion compensation module having a fixed negative dispersion (fig. 13b, element R3 and fig. 19, element 192 and col. 4, lines 53-61), the dispersion enhancement module comprising: an optical input adapted to couple to an optical transport fiber and an optical output adapted to couple to the dispersion compensation module, wherein optical signals from the optical output have a positive dispersion substantially equal to a sum of positive dispersion of the transport fiber and positive dispersion of the optical path (col. 1, lines 7-9 and lines 18-27, and col. 4, lines 31-61 and col. 9, line 64 to col. 10, line 61). Colbourne et al. do not disclose the dispersion enhancement module comprising a plurality of dispersion enhancement fibers. Ishikawa discloses a variable dispersion compensation device using switched DCFs and fixed DCFs over various positive and negative compensation values, the switched DCFs controlled by a controller (fig. 1 and fig. 13 and paragraph 0072). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the fixed and variable dispersion compensation devices of Ishikawa for the fixed and variable compensators of Colbourne et al. since dispersion compensation fiber is conventional and since the etalons of Colbourne require dimensions and free spectral range that are dependent on channel spacing of a multi-wavelength signal. Ishikawa also disclose a plurality of optical switches coupling the optical input and the dispersion enhancement fibers, the optical switches operable to form an optical path between

the optical input and the optical output, the optical path passing through one or more of the dispersion enhancement fibers (fig. 13 and paragraph 0072).

Regarding claim 17, the combination of Colbourne et al. and Ishikawa disclose the dispersion enhancement module of claim 16, wherein a magnitude of the positive dispersion of the optical signals is substantially equal to a magnitude of the negative dispersion of the dispersion compensation module (Colbourne et al.: col. 1, lines 7-9 and lines 18-27, and col. 4, lines 31-61 and col. 9, line 64 to col. 10, line 61 and Ishikawa: Ishikawa: paragraphs 0055-0057).

Regarding claim 19, the combination of Colbourne et al. and Ishikawa disclose the dispersion enhancement module of claim 16, further comprising a controller operable to: determine the negative dispersion of the dispersion compensation module, determine the positive dispersion of the optical transport fiber, and configure the switches such that a magnitude of the positive dispersion of the optical signals from the optical output is substantially equal to a magnitude of the negative dispersion of the dispersion compensation module (Colbourne et al.: col. 11, lines 3-22 and Ishikawa: fig. 13 and paragraph 0072).

Regarding claim 20, the combination of Colbourne et al. and Ishikawa disclose the dispersion enhancement module of claim 16, wherein the switches are further operable to optically couple the optical input and the optical output such that the optical path bypasses the dispersion enhancement fibers (Ishikawa: fig. 13 and paragraph 0072).

3. Claims 12 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Colbourne et al. (US Patent No. 6654564) in view of Ishikawa (US Patent Application Publication No. 2002/0003646) as applied to claims 1-9, 11, 13-17, 19 and 20 above, and further in view of Feinberg (US Patent Application Publication No. 2003/0031433).

Regarding claim 12, the combination of Colbourne et al. and Ishikawa discloses the method of claim 9, and the controller determining the correct dispersion compensation adjustment (Colbourne et al.: col. 11, lines 3-22 and Ishikawa: fig. 13 and paragraph 0072), but do not disclose detecting a switch from the transport fiber to a backup optical transport fiber, the backup transport fiber having a third positive dispersion; and reconfiguring the dispersion enhancement module to provide fourth positive dispersion, the sum of the third positive dispersion and the fourth positive dispersion substantially equal to the magnitude of the negative dispersion. Feinberg disclose a protected optical transmission system where different dispersion compensation values are used for each of the received working and protection signals (fig. 4, elements 420, 425 and 322 and paragraphs 0037 and 0041). It would have been obvious to one of ordinary skill in the art at the time of the invention that a protection switched optical input could be supplied to the dispersion compensation system of the combination of Colbourne et al. and Ishikawa, and that the controller of the combination of Colbourne et al. and Ishikawa would detect a change in the needed amount of dispersion compensation if the incoming fiber signal was switched due to a protection switch, in order to provided the advantage of adding a protected input to the combination of Colbourne et al. and Ishikawa without having to duplicate the dispersion compensation system since it would automatically adjust the dispersion compensation for either of the working or protect input signal.

Regarding claim 18, the combination of Colbourne et al. and Ishikawa discloses the dispersion enhancement module of claim 16, and the controller determining the correct dispersion compensation adjustment (Colbourne et al.: col. 11, lines 3-22), but do not disclose a controller operable to: detect a switch from the optical transport fiber to a backup optical transport fiber; determine a difference in magnitudes of the negative dispersion of the dispersion compensation module and a positive dispersion of the backup optical transport fiber; and

reconfigure the optical switches such that the optical path has a positive dispersion equal to the difference in the magnitudes. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of Feinberg with the combination of Colbourne et al. and Ishikawa as described above for claim 12.

Response to Arguments

4. Applicant's arguments with respect to claims 1-3, 5, 8, 9 and 11 have been considered but are moot in view of the new ground(s) of rejection.

5. Applicant's arguments with respect to claims 4, 6, 7, 10 (now canceled by applicant), 13-17, 19 and 20, and their dependent claims, have been fully considered but they are not persuasive.

The applicant argues that the combination of Ishikawa fails to teach or suggest every element of the claim of 13, specifically that the combination fails to teach or suggest that the optical output of the dispersion compensation fiber has a negative dispersion relative to the optical input of the dispersion compensation fiber. However, this is clearly taught by Ishikawa for the dispersion compensation fiber (see Ishikawa paragraph 0057).

The applicant also argues that the combination fails to teach or suggest that the optical input [of the first amplifier] has a positive dispersion substantially equal to the positive dispersion of the optical fiber plus a selected one of the amount of the dispersion in the DEM. However, the combination teaches this limitation as described above for claim 13. Colbourne et al. and Ishikawa both teach a DEM and DCM, and Ishikawa provide the teaching of an amplifier and the motivation for two amplifiers. The applicant's argument against the combination seems to be based on the order of elements in the signal flow of Ishikawa; however, the order of DEM followed by DCM is already taught by Colbourne et al., and it would have been obvious to one

of ordinary skill in the art at the time of the invention that the order of DEM and DCM in Ishikawa could be rearranged to reflect the order taught by Colbourne et al., because the two dispersion compensator devices of Ishikawa are simply either adding positive or negative dispersion with respect to the dispersion of the external transmission fiber.

The applicant argues that the examiner asserts that the teachings of one reference "improve the teachings of another reference". However, the rejections are not based on one reference simply improving the teachings of the other reference in such a broad sense. The suggestion to combine for each rejection is based on the disclosures of the references as described in the rejections. The applicant does not argue against the specific suggestions to combine except to argue that Colbourne et al. teaches away from using dispersion compensating fiber because of the statement "dispersion compensating fibers cannot compensate for wavelength dependence of dispersion" in col. 9, lines 15-16. However, the use of patents as references is not limited to what the patentees describe as their own inventions or to the problems with which they are concerned. They are part of the literature of the art, relevant for all they contain. A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art, including nonpreferred embodiments. Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments (see MPEP section 2123). In addition, the preceding sentence in the Colbourne et al. reference from the one cited in the applicant's argument already teaches an advantage of dispersion compensation fiber, stating, "Dispersion compensators such as dispersion compensating fiber can be used for providing a fixed negative or positive dispersion for optical fibres" (col. 9, lines 12-24).

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

6. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2600.

M. R. Sedighian
M. R. SEDIGHIAN
PRIMARY EXAMINER